Amendment to the Claims:

The listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-5 Cancelled.

6. (New) A method for speeding up forming a stochastic numerical model of a Gaussian type or a type representative of a distribution of a physical quantity in a porous heterogeneous medium, calibrated in relation to dynamic data obtained by measurements performed in the medium or by previous observations, and a characteristic of displacement of fluids therein, comprising an iterative process of deformation wherein an initial realization of at least part of the medium is linearly combined, upon each iteration, with at least a second realization independent of the initial realization, coefficients of the linear combining being such that a sum of the squares of the coefficient is 1, and an objective function measuring a difference between a set of non-linear data deduced from the linear combining by means of a flow simulator and the geologic and dynamic data are minimized by adjusting the coefficients of the linear combining, the iterative process being repeated until an optimum realization of the stochastic model is obtained in which a rate of deformation to an optimum model representative of the medium is accelerated by selecting as the second realization to be combined with the initial realization at least one composite realization obtained by selecting beforehand a direction of descent

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defined as a function of gradients of an objective function in relation to all the components of the initial realization.

7. (New) A method as claimed in claim 6, wherein the at least one composite realization is obtained by linear combination of a set of P independent realizations of the model, the coefficients of the linear combining being calculated so that a direction of descent from the initial realization is attempted to be made equal to a realization defined by the gradients of the objective function in relation to all components of the initial realization.

8. (New) A method as claimed in claim 6, wherein optimization is carried out from a deformation parameter which controls the combining between the initial realization and the composite realization.

9. (New) A method as claimed in claim 7, wherein optimization is carried out from a deformation parameter which controls the combining between the initial realization and the composite realization.

10. (New) A method as claimed in claim 6, wherein the combining affecting only a part of an initial realization and the iterative process of gradual deformation is applied to a Gaussian white noise used to generate a Gaussian realization and derivatives of the objective function with respect to components of Gaussian white noise are determined.

11. (New) A method as claimed in claim 7, wherein the combining affecting only a part of an initial realization and the iterative process of gradual deformation is applied to a Gaussian white noise used to generate a Gaussian realization and derivatives of the objective function with respect to components of Gaussian white noise are determined.

12. (New) A method as claimed in claim 8, wherein the combining affecting only a part of an initial realization and the iterative process of gradual deformation is applied to a Gaussian white noise used to generate a Gaussian realization and derivatives of the objective function with respect to components of Gaussian white noise are determined.

13. (New) A method as claimed in claim 9, wherein the combining affecting only a part of an initial realization and the iterative process of gradual deformation is applied to a Gaussian white noise used to generate a Gaussian realization and derivatives of the objective function with respect to components of Gaussian white noise are determined.

14. (New) A method as claimed in claim 6, wherein the initial realization is combined with a number M of composite realizations with all the composite realizations being obtained by composition from P independent realizations of a Gaussian random field, the optimization involving M parameters.

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15. (New) A method as claimed in claim 7, wherein the initial realization is combined with a number M of composite realizations with all the composite realizations being obtained by composition from P independent realizations of a Gaussian random field, the optimization involving M parameters.

16. (New) A method as claimed in claim 8, wherein the initial realization is combined with a number M of composite realizations with all the composite realizations being obtained by composition from P independent realizations of a Gaussian random field, the optimization involving M parameters.

17. (New) A method as claimed in claim 9, wherein the initial realization is combined with a number M of composite realizations with all the composite realizations being obtained by composition from P independent realizations of a Gaussian random field, the optimization involving M parameters.

18. (New) A method as claimed in claim 10, wherein the initial realization is combined with a number M of composite realizations with all the composite realizations being obtained by composition from P independent realizations of a Gaussian random field, the optimization involving M parameters.

19. (New) A method as claimed in claim 11, wherein the initial realization is combined with a number M of composite realizations with all the composite realizations being obtained by composition from P independent realizations of a Gaussian random field, the optimization involving M parameters.

20. (New) A method as claimed in claim 12, wherein the initial realization is combined with a number M of composite realizations with all the composite realizations being obtained by composition from P independent realizations of a Gaussian random field, the optimization involving M parameters.

21. (New) A method as claimed in claim 13, wherein the initial realization is combined with a number M of composite realizations with all the composite realizations being obtained by composition from P independent realizations of a Gaussian random field, the optimization involving M parameters.